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State of California
AIR RESOURCES BOARD

**CALIFORNIA REFUELING EMISSION STANDARDS AND TEST PROCEDURES
FOR 2001 AND SUBSEQUENT MODEL MOTOR VEHICLES**

Adopted: August 5, 1999
Amended: September 5, 2003
Amended: June 22, 2006
Amended: October 17, 2007
Amended: [insert amended date]

Note: Proposed amendments to this document are shown in underline to indicate additions and ~~strikeouts~~ to indicate deletions compared to the test procedures as last amended October 17, 2007. Existing intervening text that is not amended is indicated by a row of asterisks (* * * *).

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NOTE: This document is incorporated by reference in section 1978(b), title 13, California Code of Regulations (CCR). Additional requirements necessary to complete an application for certification of motor vehicles are contained in other documents that are designed to be used in conjunction with this document. These other documents include:

1. “California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles” (incorporated by reference in section 1961(d), title 13, CCR);
2. “California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes” (incorporated by reference in section 1962(h), title 13, CCR);
3. “California Evaporative Emission Standards and Test Procedures For 2001 and Subsequent Model Motor Vehicles” (incorporated by reference in section 1976(c), title 13, CCR).
4. “Malfunction and Diagnostic System Requirements – 1994 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines” (incorporated by reference in section 1968.1, title 13, CCR).
5. “Malfunction and Diagnostic System Requirements – 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines” (incorporated by reference in section 1968.2, title 13, CCR).
6. “Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks” (incorporated by reference in section 2235, title 13, CCR).

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The provisions of Title 40, Code of Federal Regulations (CFR), Part 86, Subparts B (as adopted or amended by the U.S. Environmental Protection Agency (U.S. EPA) on the date listed) and S (as adopted on May 4, 1999, or as last amended on such other date set forth next to the 40 CFR Part 86 section title listed below) to the extent they pertain to the testing and compliance of vehicle refueling emissions for passenger cars, light-duty trucks and medium-duty vehicles, are hereby adopted as the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles," with the following exceptions and additions.

Subpart S Requirements

I. General Certification Requirements for Refueling Emissions

A. Applicability

1. These refueling standards and test procedures are applicable to all new 2001 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, natural gas-fueled, and hybrid electric passenger cars, light-duty trucks and medium-duty vehicles with a gross vehicle weight rating of less than 8,501 lbs. In cases where a provision applies only to a certain vehicle group based on its model year, vehicle class, motor fuel, engine type, or other distinguishing characteristics, the limited applicability is cited in the appropriate section or paragraph.

2. For general certification purposes, the requirements set forth in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles;" the "California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes;" and, the "California Evaporative Emission Standards and Test Procedures For 2001 and Subsequent Model Motor Vehicles," shall apply, except as otherwise noted in these test procedures.

3. Reference to vehicle sales throughout the United States shall mean vehicle sales in California, except when certifying to the refueling standards, in which case, vehicle sales shall mean throughout the United States.

4. A small volume manufacturer is defined as any vehicle manufacturer with California actual sales less than or equal to 4500 new vehicles per model year based

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on the average number of vehicles sold by the manufacturer in the previous three consecutive years.

5. Regulations concerning U.S. EPA hearings, inspections, specific language on the Certificate of Conformity, alternative useful life, and selective enforcement audit shall not be applicable to these procedures, except where specifically noted.

6. In those instances where testing conditions or parameters are not practical or feasible for vehicles certified to the refueling standards, the manufacturer shall provide a test plan that provides equal or greater confidence in comparison to these test refueling procedures. The test plan must be approved in advance by the Executive Officer.

7. The term "[no change]" means that these test procedures do not modify the applicable federal requirement.

8. The specifications for the fuel used in testing are set forth in 40 CFR §86.113-94 (February 18, 2000). California certification fuel is not allowed for certification or in-use testing.

B. Definitions, Acronyms, Terminology

These test procedures incorporate by reference the definitions set forth in the Code of Federal Regulations; and, the definitions as set forth in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," and in the "California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes."

C. Useful Life

1. Delete §86.1805-01; §86.1805-04 and replace with:

"Useful life" shall have the same meaning as provided in Title 13, CCR, §2112.

D. On-Board Diagnostics

1. Delete §86.1806 and replace with:

The applicable sections of the "Malfunction and Diagnostic System Requirements for 1994 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines," as set forth in Title 13, CCR, Section 1968.1 et seq., as applicable; and, the "Malfunction and Diagnostic System

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Requirements – 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines,” as set forth in title 13, CCR, section 1968.2, are hereby incorporated by reference into this test procedure. For purposes of this test procedure, all references to evaporative system monitoring, malfunction criteria, and MIL illumination and fault code storage shall also apply to refueling systems.

E. General Standards, increase in emissions; unsafe conditions; waivers

1. Amend §86.1810-01 (July 12, 2001) as follows:
 - 1.1. (a) through (j). [See the “California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles,” ~~adopted August 5, 1999, as last amended June 22, 2006;~~ or the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles,” ~~adopted August 5, 1999, as last amended June 22, 2006.~~]
 - 1.2. (k) [No change.]
 - 1.3. (l) Substitute certification to the applicable refueling emission standards set forth in section I.I.F. of these test procedures instead of with the standards set forth in §86.1811-04(e); §86.1812-01(e); §86.1813-01(e); and, §86.1816-05(e).
 - 1.4. (m) Substitute compliance with applicable refueling emission standards set forth in section I.I.F. of these test procedures instead of with the standards set forth in §86.1811-04(e); §86.1812-01(e); §86.1813-01(e); and, §86.1816-05(e).
 - 1.5. (n) [No change.]
 - 1.6. (o) and (p) [See the “California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles,” ~~adopted August 5, 1999, as last amended June 22, 2006.~~]
 - 1.7. A manufacturer must demonstrate compliance with the fuel spillage test requirements in Title 13, California Code of Regulations, §2235, the “Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks,” ~~as last amended January 22, 1990,~~ which is hereby incorporated by reference herein.
2. In addition to the provisions set forth in these test procedures, the ARB reserves the authority to require testing to enforce compliance and to prevent noncompliance with the refueling emission standard.
3. Vehicles certified to the refueling emission standards set forth in Section I.F.2.2. below, shall not be counted in the phase-in sales percentage compliance determinations.

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F. Emission Standards

1. Delete 40 CFR §§86.1811 through 86.1816 (all years).
2. The maximum refueling emissions for 2001 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles with a gross vehicle weight rating less than 8,501 lbs. for the full useful life are:
 - 2.1. For gasoline-fueled, alcohol-fueled, diesel-fueled, fuel-flexible, and hybrid electric vehicles: 0.20 grams hydrocarbons per gallon of fuel dispensed. [For purposes of these test procedures, hydrocarbons shall mean organic material hydrocarbon equivalent for alcohol-fueled vehicles.] For liquefied petroleum gas-fueled vehicles: 0.15 grams hydrocarbons per gallon of fuel dispensed.
 - 2.2. Vehicles powered by diesel fuel are not required to conduct testing to demonstrate compliance with the refueling emission standards set forth above, provided that all of the following provisions are met:
 - (A) The manufacturer can attest to the following evaluation:
“Due to the low vapor pressure of diesel fuel and the vehicle tank temperatures, hydrocarbon vapor concentrations are low and the vehicle meets the 0.20 grams/gallon refueling emission standard without a control system.”
 - (B) The certification requirement described in paragraph section 2.2.(A) is provided in writing and applies for the full useful life of the vehicle.

G. Durability Demonstration procedures for refueling emissions.

§86.1825-01 [October 6, 2000]- Amend as follows: Add the following sentences to the first paragraph:

Beginning with 2010 model-year vehicles or engines, at the time of certification manufacturers shall state, based on good engineering judgment and available information, that the emission control devices on their vehicles or engines are durable and are designed and will be manufactured to operate properly and in compliance with all applicable requirements for the full useful life (or allowable maintenance interval) of the vehicles or engines. Also, vehicles and engines tested for certification shall be, in all material respects, substantially the same as production vehicles and engines. If it is determined pursuant to title 13 CCR, Division 3, Chapter 2, Article 5, sections 2166 through 2174 that any emission control component or device experiences a systemic failure because valid failures for that component or device meet or exceed four percent or 50 vehicles (whichever is greater) in a California-certified engine family or test group, it constitutes a violation of the foregoing test procedures and the Executive Officer of the Air Resources Board may require that the vehicles or engines be recalled or subjected to corrective action as set forth in title 13 CCR, Division 3, Chapter 2, Article 5, sections 2166 through 2174. Certification applications may not be denied based on the foregoing information provided that the manufacturer commits to correct the violation.

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Subpart B - Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles and New Light-Duty Trucks; Test Procedures

40 CFR §§ 86.101 through 86.145 and Appendix I (UDDS Schedule) of this Subpart B, as incorporated by reference and amended in the “California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles,” the “California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes,” and, the “California Evaporative Emission Standards and Test Procedures For 2001 and Subsequent Model Motor Vehicles,” are hereby incorporated by reference herein.

II. Refueling Emissions Test Procedures

A. Fuel Spitback Emissions

1. §86.146-98 Fuel dispensing spitback procedure- [August 23, 1995]-
[No change].

B. Refueling Emissions

1. §86.150-98 Refueling test procedure; Overview, refueling test-
[September 21, 1994].

1.1. Amend subparagraph (a), first sentence, as follows: The refueling emissions test procedure described in this and subsequent sections is used to determine the conformity of vehicles with the refueling emissions standards set forth in section I.F. of these test procedures for all of the vehicles types specified in section I.A.

2. §86.151-98 General requirements; refueling test- [April 6, 1994]-

3. §86.152-98 Vehicle preparation; refueling test- [December 8, 2005]
[No change].

4. §86.153-98 Vehicle and canister preconditioning; refueling test-
[December 8, 2005]

4.1. Amend subparagraph (a) to include: The vehicle preconditioning drive for 2011 and later model-year off-vehicle charge capable hybrid electric vehicles shall include two complete UDDSs performed entirely under a charge-sustaining mode of operation. The battery state-of-charge net change tolerance provisions specified in section F.9., of the “California Exhaust Emission Standards and Test Procedures for

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2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes” shall apply.

4.2. Amend subparagraph (c)(1) to include: A 2011 and later model-year off-vehicle charge capable hybrid-electric vehicle that is tested either for exhaust emissions only or for refueling emissions, shall be processed in accordance with the provisions of section F, of the “California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes,” with the following exceptions.

4.2.1. For such vehicles, the battery state-of-charge setting prior to the cold start exhaust test shall be at the highest level allowed by the manufacturer. This requirement shall be applicable regardless of a vehicle’s ability to allow, or not to allow, manual activation of the auxiliary power unit. If off-vehicle charging is required to increase the battery state-of-charge for the proper setting, then this charging shall occur during the canister preconditioning process.

4.2.2. The battery state-of-charge net change tolerance provisions specified in section F.9., of the “California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes” shall not apply.

4.3. Amend subparagraph (d) to include: A 2011 and later model-year off-vehicle charge capable hybrid electric vehicle shall be processed in accordance with the provisions of section F of the “California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes,” with the following exception.

4.3.1. For such vehicles, the battery state-of-charge setting prior to either the chassis dynamometer or the test track driving procedures, as applicable, shall be at the highest level allowed by the manufacturer. This requirement shall be applicable regardless of a vehicle’s ability to allow, or not to allow, manual activation of the auxiliary power unit. If off-vehicle charging is required to increase the battery state-of-charge for the proper setting, then this charging shall occur during the canister preconditioning process.

4.3.2. The battery state-of-charge net change tolerance provisions specified in section F.9., of the “California Exhaust Emission Standards and Test Procedures for 2011 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, In The Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes” shall not apply.

4.3.3. In order to reduce the amount of time required to consume 85 percent of the fuel tank capacity, as required by either subparagraph (d)(1) or (d)(2), as applicable, a manufacturer may, with advance approval of the Executive Officer, elect to set the battery state-of-charge at a level that is less than specified in section II.B.4.3.1., prior to conducting either the chassis dynamometer or the test track driving procedure, as applicable.

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4.3.4. The Executive Officer may use any of the following battery state-of-charge levels for purposes of either certification confirmatory or in-use compliance testing of such vehicles.

4.3.5. As specified in section II.B.4.3.1.

4.3.6. If applicable, at the level approved under section II.B.4.3.3.

4.3.7. If applicable, at any level in-between the levels indicated by sections II.B.4.3.1 and II.B.4.3.3.

5. §86.154-98 Measurement procedure; refueling test. [August 23, 1995].
[No change].

6. §86.155-98 Records required; refueling test. [April 6, 1994].
[No change].

7. §86.156-98 Calculations. [April 6, 1994]. [No change].